Deep-Sea Newsletter, 19, 20-22, 1992

THE ANTARCTIC DEEP-SEA HEXACTINELLID FAUNA

An often mentioned characteristic of the Antarctic benthos is the exorbitant occurrence of hexactinellid sponges all around the continent (Topsent 1912, Koltun 1970). To be precise, this dominance is found only on the shelf, and it is due to a high abundance of large-sized specimens of between 2 and 6 species - the number accepted depending on each author's ideas on synonymy (Burton 1929, Koltun 1976, Barthel & Tendal in prep.).

There are only two records of hexactinellids from the slope, and it can be questioned if there is a special bathyal sponge fauna at all in the Antarctic (Barthel & Tendal 1989).

At present, the Antarctic abyssal hexactinellid fauna comprises 23 recognized species (Table 1) taken at few localities, which are unevenly spread around only half of the continent (Fig. 1). These species all belong to families and - with the exeption of two - to genera widely distributed at abyssal depths in the three large oceans (Lévi 1964).

Of the 23 species, 18 have only been found in the Antarctic region; this high "endemism" is, however, misleading, as 16 species (about 70 %) have only been found once, and another 5 only two or three times. The situation is typical for the deep-sea hexactinellid fauna worldwide, as 115 (76%) of the about 150 species known from depths greater than 2000 m have been found only once (Lévi 1964, Tendal unpublished).

Five species have been recorded in other oceans as well, i.e. one worldwide but not abyssally, two in the Atlantic, one in the Atlantic and the Pacific, and one in the Pacific and Indian Oceans; thus, the basis for conclusions on faunal relationships is too small.

The poor knowledge of the Antarctic deep-sea hexactinellids is further thrown into relief by the fact that 12 species are known only as fragments, a situation impeding even the simplest conclusions on biological features. For some species it is known, and for others it can be deduced from the (most often scantily) known congenerics that 13 species probably are soft-bottom inhabitants, 5 may live on hard substrates, and for 5 nothing can be said. So the pack ice area that influences the distribution pattern of species of many other classes by delivering dropstones that can serve as substrates (Picken 1985), does not seem to be a decisive factor in hexactinellid distribution (Picken 1985).

The picture of the taxonomic composition of the Antarctic deep-sea hexactinellid fauna is very incomplete, and nothing is known about distribution

patterns, fauna relationships and general biology. *We would therefore like ourselves to work up pertinent existing collections, as well as to take part in the planning of programs, projects and cruises that might provide relevant material.* Being both the only topographic link between the large deep-sea regions of the world oceans and also the region where most of the globe's deep-water is produced, the ocean around the Antarctic continent houses a fauna that can provide the answers to a number of questions concerning present and past evolutionary, biological and biogeographical events.

Dagmar Barthel
Institut für Meereskunde, Kiel

Ole S. Tendal
Zoological Museum, Copenhagen

References

Barthel, D. & O.S. Tendal, 1989: The sponge fauna of the deep Weddell Sea: status and the need for further biological and faunistic investigations. - Deep-Sea Newsletter *16*: 8-9.

- - in prep.: Antarctic Hexactinellida. - *In*: J.W. Wägele & J. Sieg (eds.): Synopses of the Antarctic Benthos.

Burton, M., 1929: Porifera. Part II. Antarctic Sponges. - British Antarctic Expedition 1910, Zoology *VI*: 393-458.

Koltun, V.M., 1970: Sponges of the Arctic and Antarctic; a faunistic review, - Symposia of the Zoological Society of London *25*: 285-297.

- 1976: Porifera, part I: Antarctic sponges. - B.A.N.Z. Antarctic Research Expedition Reports, Series B (Zoology and Botany) *IX*: 147-198.

Lévi, C., 1964: Spongiaires des zones bathyale, abyssale et hadale. - Galathea Report *7*: 63-112.

Picken, G.B., 1985: Marine habitats - Benthos. - *In*: W.N. Bonner & D.W.H. Walton (eds.): Antarctica, Pergamon Press, Chapter *4*: 154-172.

Topsent, E., 1912: Sur la contribution apportée par les explorations scientifiques dans l'Antarctique a la connaissance des "Euplectellinæ". - C.R. Assoc.Franc.Sc. *40*: 518-520.

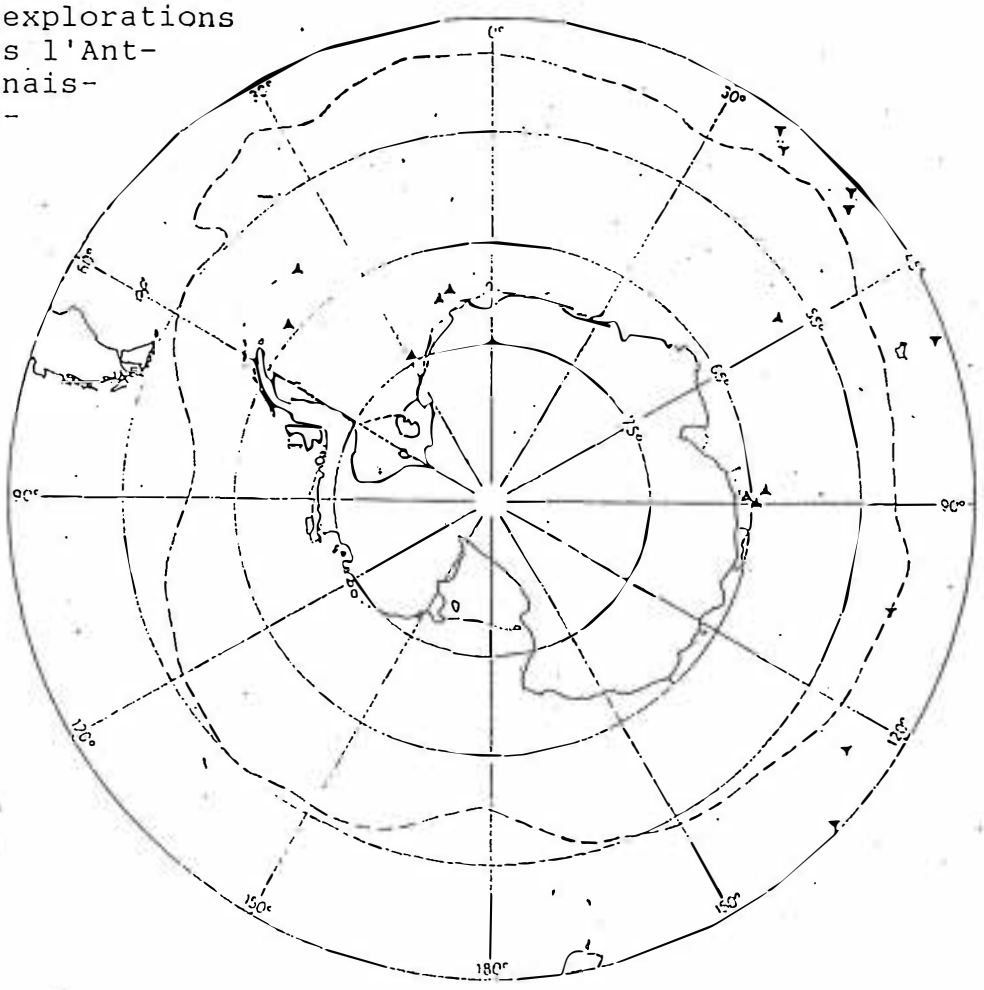

Fig.1. Localities in Antarctica at depths larger than 2000 m from where hexactinellids have been reported. ▲ = localities within the pack ice limit. ▼ = localities outside the pack ice limit, but close to the Antarctic convergence.

Table 1. The species of hexactinellid sponges known from the Antarctic deep-sea region and adjacent areas, and the corresponding bathymetric range.

*: occurs largely within the Antarctic convergence zone.
+: occurs only in ("endemic" to) the Antarctic deep sea.
(): number of records outside the Antarctic deep sea and adjacent areas;
#: taken many times.

SPECIES	RECORDS		
	Geographical area	No	Range (m)
Hyalonema clavigera Schulze, 1886	Crozet Isls	1	2928
H. conus Schulze, 1886	S. of Australia	1	3300
H. drygalskii Schulze & Kirkpatrick, 1910*+	Wilhelm II Land	1	2795
Farrea occa Bowerbank, 1862*	Bellingshausen Sea, E. Weddell Sea	2(#)	450-2000
Chonelasma lamella Schulze, 1886*	E. Weddell Sea, Wilhelm II Land, Crozet Isls	7(2)	430-3397
Bathyxiphus sp. Schulze & Kirkpatrick 1910*	Wilhelm II Land	2(1)	2450-3397
Aulocalyx irregularis Schulze, 1886*	Wilhelm II Land, Marion-Crozet Isls, Pr. Edwards Isl.	3	567-3397
Holascus fibulatus Schulze, 1886	S of Australia, N of Kerguelen Isl.	2	2516-4758
H. obesus Schulze, 1904*+	Enderby Land	1	4636
H. polajevii Schulze, 1886	S of Australia	1	2928
H. tenuis Schulze, 1904 *+	Enderby Land	1	4636
Malacosaccus coatsi Topsent, 1910*+	E Weddell Sea	1	2580
M. pedunculatus Topsent, 1910*+	E Weddell Sea	1	2580
M. vastus Schulze, 1886	N of Kerguelen Isl.	1	2543
Acoelocalyx brucei Topsent, 1910*+	C Weddell Sea	1	4547
Docosaccus ancoratus Topsent, 1910*+	C Weddell Sea	1	4547
Caulophacus antarcticus Schulze & Kirkpatrick, 1910*+	Wilhelm II Land	1	2450-3397
C. instabilis Topsent, 1910*+	S. Orkney Isls	1	3248
C. pipetta (Schulze, 1886)	SW of Australia	1	3566
C. scotiae Topsent, 1910*+	E Weddell Sea	1	2580
C. valdiviae Schulze, 1904*+	? Bellingshausen Sea, Enderby Land	2	450-4636
Bathydorus spinosus Schulze, 1886*	Bellingshausen Sea, E Weddell Sea, Crozet Isls	5(3)	569-4847
Calycosoma validum Schulze, 1899*	Near South Orkney	1(1)	3266